Remarks

The Examiner takes note that much of the issue underlying the rejections relates to applicants' use of "vague terminology" to describe the magnetic [sic] patterns." Specifically, the Examiner objects to applicants "referring to a pattern that is 'effectively random' and that conductivity patterns vary according to different 'variables' and that these variables include 'variations'." In fact, the Examiner says "a pattern being 'effectively random' has no meaning, except as it relates to the various coding steps and procedures that go into making it 'effectively random'."

Applicants respectfully disagree. Applicants have carefully defined the term 'effectively random' to describe differences between conductivity patterns throughout the specification both explicitly by operative definition and implicitly by both analogy and example. The words "effectively" and "random" considered as either separate words or a single term are used in the specification and claims consistent with their ordinary and customary meanings but with clearer applicability to the purposes of the invention.

Attention is drawn to paragraph 26 of the specification as reproduced below, where Applicants explicitly define the term "effectively random" and say exactly what the term is intended to cover in the context of the invention.

> The variations in the conductivity characteristics of the conductivity patterns for defining the unique signatures are referred to as "effectively random", which is intended to cover situations in which the resulting conductivity pattern includes conductivity characteristics that are arrived at by chance more than design by deliberately introducing one or more sources of variation that are not sufficiently controlled to produce a particular

result or that incorporate such variability as to produce individual results that vary in a non-incremental fashion with respect to each other in accordance with multiple measuring criteria. Although the required variation is preferably within certain bounds of measurement, the measured characteristics are preferably free to vary throughout a continuum of values within the certain bounds. The resulting "signature" expressed by the conductivity pattern is preferably acquired as a result of a plurality of measurements covering different regions of the conductivity pattern.

The variation among conductivity patterns is equated in the specification to "signatures" or "fingerprints". See for example paragraph 6 beginning at the first line of the Brief Summary of the Invention". Are signatures and fingerprints random? Perhaps yes, perhaps no; but they clearly incorporate such variation as to be "effectively random". The differences among signatures or among fingerprints are clearly significant and it is this type of variation that the specification refers to as "effectively random". In fact, the result is a type of signature itself.

The specification abounds with examples. The conductivity patterns can be applied to substrates by printing with an electrically conductive medium such as an electrically conductive ink (paragraph 8). The conductivity patterns can be subject to variations (a) in the distributions of the conductive medium over surfaces of the printable substrates, (b) in the distributions of the conductive medium with respect to a depth dimension of the printable substrates, and (c) in the distributions of conductivity within the conductive medium as it is distributed within the surface and depth distributions of the conductive medium (paragraph 9). The printable substrates can be treated in advance, such as by variations in porosity or surface morphology, to affect the distributions of conductivity (paragraph 10). The

substrates already printed with the conductive medium can be further treated for such purposes as redistributing the conductivity (paragraph 11).

The specification teaches that such variability in the conductivity pattern on printed articles can be produced on press during a manufacturing process. Printing rollers can be varied in etch depth and diameter, different diameter rollers can be used at multiple printing stations, printing can be applied to different levels, the composition of the conductive ink can be allowed to vary, non conductive ink can be printed on the advancing web to vary the porosity of the web, the web itself can be allowed to drift from side to side. After printing, etching, embossing, or heating can further vary the conductivity patterns (paragraphs 74-77).

Independent claim 1 to this invention is not limited to just one way of varying conductivity patterns among printable articles (when the specification teaches that there are so many ways and that such ways are best used in combination), but requires the conductivity patterns to differ with a variability that is effectively random and detectable as signatures that differ from each other. Independent claim 23 requires the individual conductivity patterns on the printed substrates to be detectable as unique signatures that differ from one another in an effectively random manner.

Applicants are entitled to draft claims covering the range of examples they have set forth for carrying out their invention using available terms that encompass the range or using terms of their own definition that encompass the range. Here, applicants have done both. The term "effectively random" clearly means "at least random in effect" and the claimed variations among conductivity

patterns on printable articles are clearly meant to be "at least random in effect" for the purposes contemplated by the invention. But more than that, applicants have supplied their own operative definition that specifically says what the term covers for the purposes of the invention.

The Examiner is clearly aware of case law that says that words in the claims are to be given their ordinary and customary meanings, yet patentees are free to be their own lexicographers and may define claim terms in ways that differ from the common understanding of those skilled in the art (Markman v. Westview Instruments, Inc 34 USPQ2d 1321). Here, applicants have used the term "effectively random" consistent with its ordinary and customary meaning and have also further explicitly refined the meaning of the term in the context of the invention. The MPEP itself says "when the specification states the meaning that a term in the claim is intended have, the claim is examined using that meaning" (MPEP 2173.05(a)).

Indefiniteness Rejection

Claims 1-36, 142 and 143 stand rejected under 35 USC §112, second paragraph for a number of different reasons including the fact that both independent claims 1 and 23 recite " a variability that is effectively random." The Examiner asks, "What is the meaning of 'effectively random'?" For the answer to this, we commend to the Examiner the explicit definition of the term in paragraph 26 of the specification and the other references to the specification in the introductory discussion above. The same argument applies to dependent claim 9.

Claims 2 and 3 are objected to because the examiner is not clear what in or out of registration means. The Examiner asks, "in or out of registration with

respect to what?" The answer is found in the claims themselves. Claim 2 says "the differences between the conductivity patterns are formed by one or more in-line processes that are not repeated in registration with the succession of printable articles." Claim 3 specifies the in-line processes as including printing out of registration with the succession of printable articles. Thus it is clear that the printing is out of registration with respect to the succession of printable articles.

Those of skill in the in-line printing arts are keenly aware of the importance of printing in registration with a succession of printable articles so that each label, for example, is printed with the same logo as every other label in the succession. If allowed out of registration, part of the logo intended for one label would be printed on another label and the logo would not be centered on successive labels. Although contrary to routine practice, those of skill will have no trouble understanding the meaning of printing out of registration with a succession of printable articles.

Claim 5 is rejected because the phrase "free to vary over a continuum" is regarded as unclear. Claim 5 refers to conductivity characteristics of the conductivity patterns being free to vary over a continuum. The phrase simply means the conductivity characteristics can vary in a way that is not limited to incremental variations. Paragraph 23 of the specification provides an example in which the required variation is preferably within certain bounds of measurement, but the measured characteristics are preferably free to vary throughout a continuum of values within the certain bounds.

Claims 7 and 8 are rejected because the language of "conductivity patterns differ from the patterns of the conductive medium" is regarded as unclear. However, how the patterns differ is apparent from the further language of claim 7, which states that the difference is "in accordance with other variables that affect conductivity characteristics within the patterns of the conductive medium." For example, the conductive medium, such as a conductive ink, could be printed in the pattern of a bar. And, as set forth in claim 8, variations in the conductive medium (e.g., ink), the web on which the ink is printed, or an interaction between the ink and the web can affect the conductivity pattern detectable along the length of the bar. Thus, the conductivity pattern would reflect a greater variation than merely the shape of a bar.

Claim 8 is further rejected for not more specifically reciting what variations are undergone by the conductive medium, the web, or a combination of the two. The claim states that at least one of these must undergo a variation that affects the conductivity characteristics within the patterns of the conductive medium. To say that any one element varies in a way that is subject to detection is a clear limitation over elements that are not required to so vary. The specification shows that applicants could be more specific, such as by claiming that the conductive content of the conductive medium varies. However, applicants have chosen to draft a broader claim that, nonetheless, further restricts the subject matter of its preceding claim in meaningful way. The same explanation applies to claims 31, 32, and 34.

A related problem is apparent in the Examiner's rejection of claims 10 and 11, where the examiner finds redundant language requiring "variations in both

distributions of the conductive medium over a surface of the web and distributions of conductivity within the surface distributions of the conductive medium." Claim 10 also requires the conductivity patterns to be formed at least in part by the application of a printable conductive medium to the web. One of the important teachings of the invention is that the distribution of the conductive medium does not necessarily match the distribution of conductivity. For example, the conductive medium could itself vary in conductivity.

Claim 11 requires the conductivity patterns to be affected by the depth of the conductive medium with respect to the web surface. Dimensional variations in the location of the conductive medium are taught to vary the conductivity patterns. The same explanations apply to claims 15 and 29.

Claim 35 is rejected as indefinite because the term "varies locally" is regarded as unclear. The term also appears in original claim 32. With this amendment, the "locally" portion of the term has been removed from both claims. The original intention of the term as apparent from the specification was to distinguish between global changes affecting an entire or substantial length of the web in the same way from local changes that affect the web differently along its length. Both claims require variations between the printable substrates so the local vs. global distinction is unnecessary.

Obviousness Rejection

Claims 1, 2, 4-18, 20-30, 34, and 36 stand rejected as obvious over US Patent No. 6,202,929 to Verschuur et al. in view of International Publication WO 98/49652 of Asplund. Verschuur et al. (the lead inventor in this application as well)

is said to disclose that bar codes and other patterns can be printed on documents with conductive ink and the patterns are designed to vary between the documents. The limitation of the conductive patterns varying between the documents in an "effectively random" manner was given no weight. Asplund is given credit for teaching the usage of web structure for forming different printable articles with conductive patterns.

The Examiner is believed to have errored by not according any weight or meaning to the term "effectively random" along with the other language in independent claims 1 or 23 that describes how the conductivity patterns are required to differ between the printable articles/substrates to fulfill the recited objectives of the preambles. Applicants have more than fulfilled their responsibilities for making the meaning of the term "effectively random" apparent from the specification. The term is explicitly defined using language that says exactly what the term is intended to cover. The term is implicitly defined in the specification by way of numerous examples.

The barcode patterns printed by Verschuur et al. using conductive ink are intended to encode meaningful information such as address information encoded within the contents of envelopes. Comparing the different barcode patterns of Verschuur et al. to the explicit requirements for the "effectively random" random way the claimed conductivity patterns are required to differ from each other to be detectable as signatures, the following should be noted. The resulting conductivity patterns of Verschuur are arrived at by design. The conductivity patterns of Verschuur et al are laid out in a meaningful form so that the patterns can be read to interpret their encoded meaning. The variation between the conductivity patterns is

controlled so that the resulting conductive barcode encodes the desired information. Moreover, the variation between the conductive barcode patterns of Verschuur et al. is incremental so that one barcode pattern can be clearly distinguished from another without ambiguity. The bars of a barcode pattern can vary incrementally in width (wide or narrow), height (long or short), or number.

Implicit in the understanding of the intended effects of such randomness is the element of unpredictability or at least the lack of a definite plan for how one conductive pattern is to be distinguished from another. The definition of "effectively random" requires the conductivity characteristics to be arrived at more by chance than design. Verschuur et al. and Asplund set out to read or produce conductive patterns that encode meaning or perform intended functions. The variability is controlled with a definite design in mind to achieve predetermined patterns of conductivity. The invention teaches just the opposite. The individualized signatures differ from each other, but not in prescribed ways. If the signatures embodied a target value and a counterfeiter obtained the target value, the counterfeiter could be certain of duplicating the signature. However, if the signature does not encode meaning that distinguishes it from other signatures, then a counterfeiter cannot be sure to what level of detail the conductivity pattern must be duplicated.

Claim 2 requires the conductivity patterns to be formed on the web prior to dividing the web into the succession of printable substrates and also requires the conductivity patterns to be formed by one or more in-line processes that are not repeated in registration with the succession of printable articles. The Examiner says that Verschuur et al. is lacking teaching of webs. Asplund deposits

conductive circuitry in precise registration with the smart card substrates. High positional accuracy is required. Applying conductive patterns out of registration with their intended substrates would foil the purposes of both Verschuur and Asplund.

Claims 5 and 26 requires conductivity characteristics of the conductivity patterns to be free to vary over a continuum. Verschuur et al.'s conductivity patterns are required to vary in an incremental way. Asplund is not concerned with varying conductivity patterns.

Claims 7-11 and 28-30 require the conductivity patterns or distributions to differ from the patterns or distribution at which the conductive medium is applied. Both Verschuur et al. and Asplund apply their conductive medium in the pattern of intended conductivity. Any departure is both incidental and detrimental to their purposes.

Other of the rejected dependent claims recite particular combination of structures including materials and layers that are patentable in combination with the required variations between conductivity patterns that support the provision of orientable substrates with conductivity signatures.

Allowable Subject Matter

Claims 19, 33, 142 and 143 are deemed to contain patentable subject matter over the prior art and would be allowable after the various §112 rejections are overcome. The Examiner is thanked for the favorable treatment of this subject matter. It is also noted that no rejections were made to claims 3, 31, or 33 over the

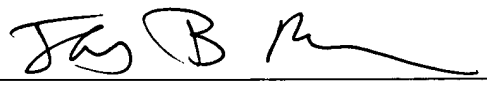
applied art. With this reply and the one amendment, all of the outstanding §112 issues are believed to be resolved. In addition, the base claims from which the allowable claims depend are also now believed to be in patentable condition over the applied art.

No claim fees are believed due in connection with this amendment.

* * *

Reconsideration and allowance of all remaining pending claims 1-36 142, and 143 are respectfully requested. For any questions on this amendment or the application, the Examiner is invited to contact applicant's representative at the telephone number given below.

Respectfully submitted,



Thomas B. Ryan, Registration No. 31,659
Customer Number 23387
HARTER, SECREST & EMERY LLP
1600 Bausch & Lomb Place
Rochester, New York 14604
Telephone: 585-231-1101
Fax: 585-232-2152